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INVESTIGATING THE IMPACT OF LIFESTYLE FACTORS ON PCOD: A COMPREHENSIVE ANALYSIS OF BMI, DIET, PHYSICAL ACTIVITY, STRESS, AND FAMILY HISTORY

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ABSTRACT

PCOD, which stands for Polycystic Ovarian Disease, is a hormonal imbalance that affects a woman's reproductive system. It is a very common condition, affecting up to 1 in 10 women of childbearing age. The influence of lifestyle factors, such as BMI, diet, physical activity, stress, and family history of PCOD, on the development and management of PCOD is quite significant. These factors play a crucial role in the hormonal imbalances and metabolic disturbances associated with PCOD. Maintaining a healthy BMI through proper nutrition and regular exercise can help regulate hormone levels and improve insulin sensitivity. A balanced diet, rich in nutrients and low in processed foods, can also positively impact PCOD symptoms. Engaging in regular physical activity can aid in weight management, reduce stress levels, and improve overall well-being. Managing stress through relaxation techniques contribute to better PCOD management. Additionally, understanding and considering one's family history of PCOD can provide valuable insights into potential genetic predispositions. By addressing these lifestyle factors, individuals with PCOD can take proactive steps towards managing their condition and promoting their overall health.

KEYWORDS: Polycystic ovarian disease, Polycystic ovarian syndrome, obesity, physical activity, family history, lifestyle modification.

INTRODUCTION

PCOD is a hormonal disorder that affects the ovaries and can lead to irregular periods, fertility issues, and other pesky symptoms. Numerous tiny cysts, or sacs filled with fluid, develop in the ovaries and are referred to as polycystic ovarian disease. Hormone levels such as those of testosterone, progesterone, FSH, and LH are altered by the disruption of the ovulation process. A number of factors come into play, including low-grade inflammation, excess testosterone, excess insulin, and heredity.[1]

The influence of lifestyle factors on Polycystic Ovary Syndrome (PCOS) is a topic of growing interest and importance in the field of women's health. PCOS is a complex endocrine disorder that affects many aspects of a woman's health, including her reproductive system, metabolism, and overall well-being. Lifestyle factors such as body mass index (BMI), physical activity levels, dietary habits, stress levels, and family history of PCOS have been identified as key determinants in the development and progression of this condition. Research has shown that women with higher BMIs are at an increased risk of developing PCOD/PCOS, as excess weight can disrupt hormonal balance and exacerbate symptoms. Physical activity has been found to have a positive impact on PCOD by improving insulin sensitivity, reducing inflammation, and promoting overall health. Dietary factors, including the quality and quantity of food consumed, play a significant role in managing PCOD symptoms and optimizing fertility. Stress, both physical and emotional, can also contribute to the development of PCOS through its effects on hormone regulation and inflammation. Furthermore, the presence of a family history of PCOS can increase an individual's susceptibility to the condition, highlighting the genetic component of this complex disorder. By understanding how these lifestyle factors interact with PCOS, healthcare providers can tailor personalized treatment plans that address the unique needs of each patient. This comprehensive approach to managing PCOS underscores the importance of lifestyle modifications in improving outcomes and enhancing quality of life for women affected by this condition.

Maintaining a healthy BMI is crucial because excess weight can worsen PCOD symptoms. By keeping our weight in a healthy range, we can help regulate our hormones and improve insulin sensitivity.

Polycystic ovarian disease is linked to obesity, insulin resistance, and the risk of developing Type 2 diabetes. It can manifest as hirsutism, acne, irregular menses, and reduced fertility.

Proper diagnosis and management are crucial, involving lifestyle changes, medications, and various investigations like ultrasound scans. Treatment focuses on addressing immediate concerns and infertility, with weight loss, exercise, diet control, and skincare being key components for overweight women.[2]

OBJECTIVES

The objective of the study was to assess the influence of lifestyle factors like BMI, diet, physical activity, stress and family history of PCOD. The study was a cross sectional descriptive study conducted with 750 samples at schools and colleges.

METHODS

This is a community based – cross sectional descriptive study. The study was conducted with 750 samples from schools and colleges. The sample size was determined as 750 by using the equation:

$$sample\ size = 1 + \frac{z^2 * p(1-p)}{e^2 N}$$

Where, N = Population Size, e = Margin of error, z = z score, p = Standard deviation

The study duration was for 6 months (December 2022- May 2023). The Institutional Review Board of Nazareth College of pharmacy, Othera, Thiruvalla, Kerala approved the study. The inclusion criteria were population of age between 14-25 and PCOD diagnosed patients. The exclusion criteria were menarche attained within one year. Data collection forms were given to obtain sufficient data and then an awareness program was held so as to improve their knowledge about PCOD. After the pre-assessment, secondly a similar form was given to evaluate their understanding about the so held programme. The data thus obtained were analysed statistically. Data was entered in Microsoft Excel – 2013 version and results were analysed using SPSS 28 and were presented in tabular form and graphical representation.

OBSERVATION AND RESULTS

The study aimed to obtain data and to assess the assess influence of lifestyle factors like BMI, diet, physical activity, stress and family history of PCOD. This was a cross sectional study conducted in schools and colleges of Thiruvalla, thaluk. The data was collected using a Questionnaire.

Table 1: Distribution of Age Group.

Sl. No	Age Group	Frequency	Percentage
1	11-15	135	18
2	16-20	502	67
3	21-25	113	15
	Total	750	100

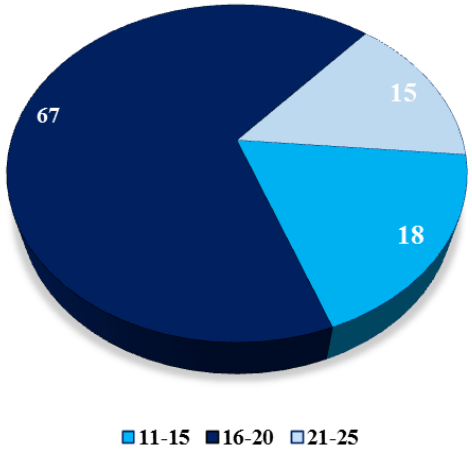

Figure 1: Distribution of Age Group.

The graph above demonstrates how the 750 study participants were divided into three age groups, with the 16 to 20 age group receiving the majority of responses.

Table 2: Distribution of Bmi.

Sl. No	BMI Category	Weight Classification	Frequency	Percentage
1	Below 18.5	Underweight	224	30
2	18.5-24.9	Normal	420	56
3	25-29.9	Overweight	80	11
4	30 or higher	Obese	26	3
	Total		750	100

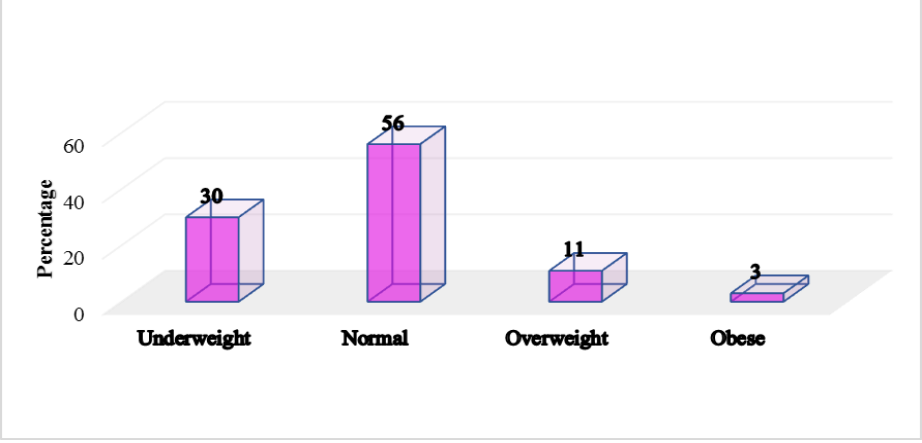

Figure 2: Distribution of Bmi.

30% of study population were underweight, **11%** of them were overweight, and **3%** were obese based on BMI.

Table 3: Distribution of Physical Activity Among The Study Participants.

Sl. No	Response	Frequency	Percentage
1	Yes	424	57
2	No	326	43
	Total	750	100

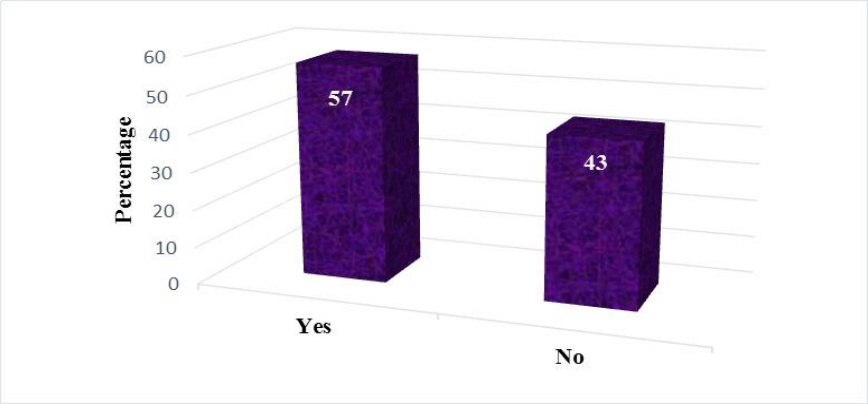

Figure 3: Distribution of Physical Activity Among The Study Participants.

Out of the 750 participants in the study, **43%** were not undergoing any physical activity.

Table 4: Distribution of Junk Food Consumption.

Sl. No	Response	Frequency	Percentage
1	Daily	97	13
2	Weekly	394	52.5
3	Monthly	225	30
4	None	34	4.5
	Total	750	100

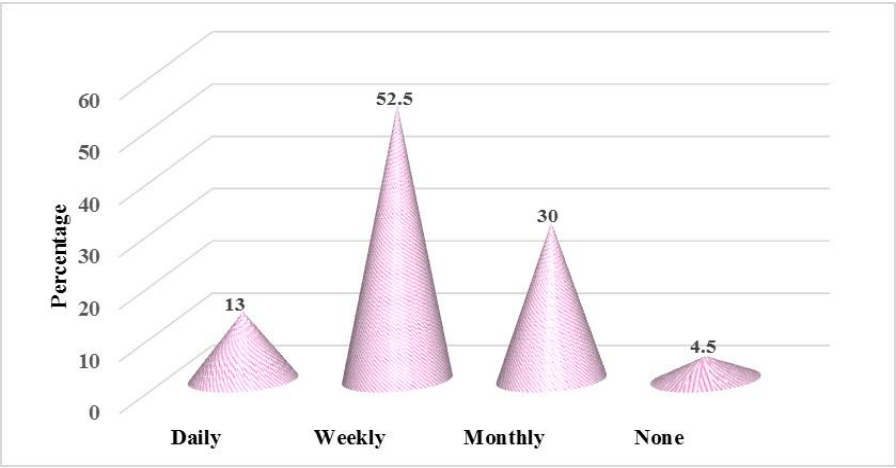

Figure 4: Distribution of Junk Food Consumption.

The above graph shows the details about the consumption of junk food in which most of the respondents were in the weekly consumption group.

Table 5: Data on Sleep Pattern.

Sl. No	Response	Frequency	Percentage
1	Very well	270	36
2	Mostly	375	50
3	Very poorly	95	13
4	Insomnia	10	1
	Total	750	100

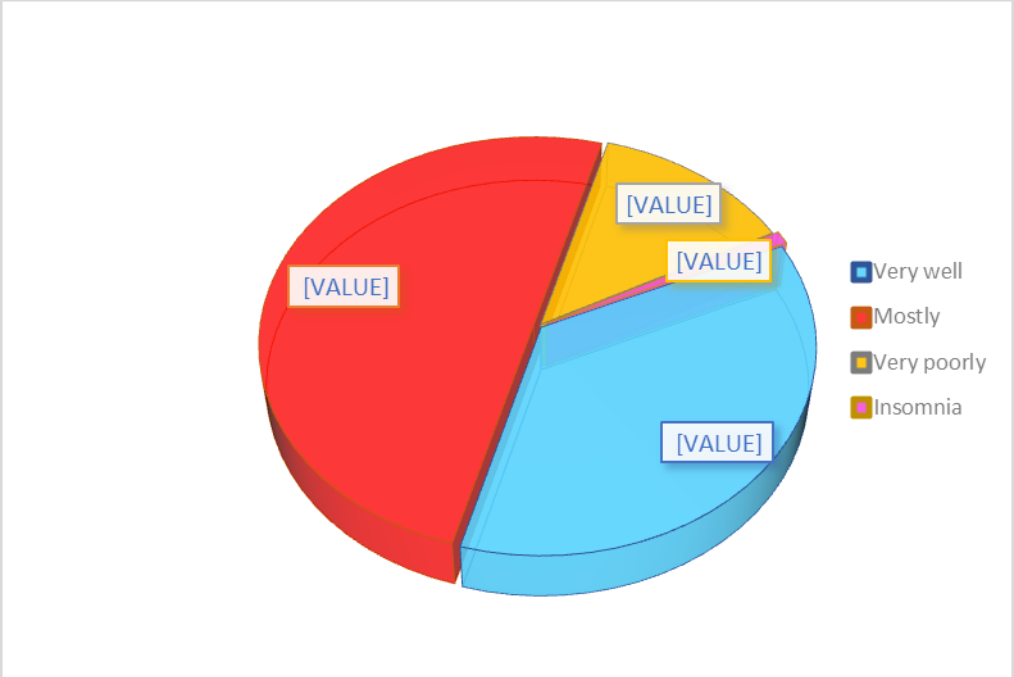

Figure 5: Graph on Sleep Pattern.

The above graph shows the sleep pattern of the study population. They were divided into 4 groups based on their sleep data and most of the respondents are in the mostly group.

Table 6: Data on Fatigue In The Study Population.

Sl. No	Response	Frequency	Percentage
1	Usually	103	14
2	Sometimes	521	70
3	At times	116	15
4	Never	10	1
	Total	750	100

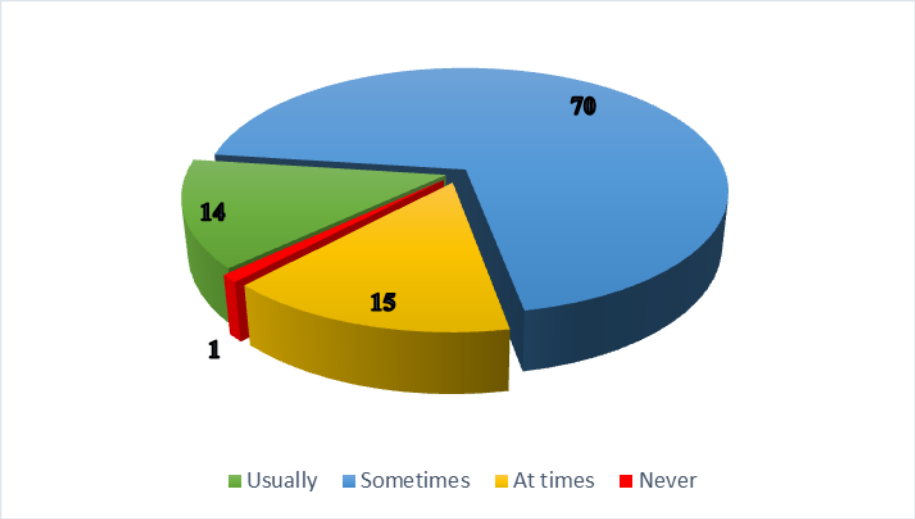

Figure 6: Graph on Fatigue In The Study Population.

The above graph shows the tiredness the study population feels during a day and most of the respondents feels tired sometimes.

Table 7: Distribution of Family History of Pcod.

Sl. No	Response	Frequency	Percentage
1	Yes	68	9
2	No	682	91
	Total	750	100

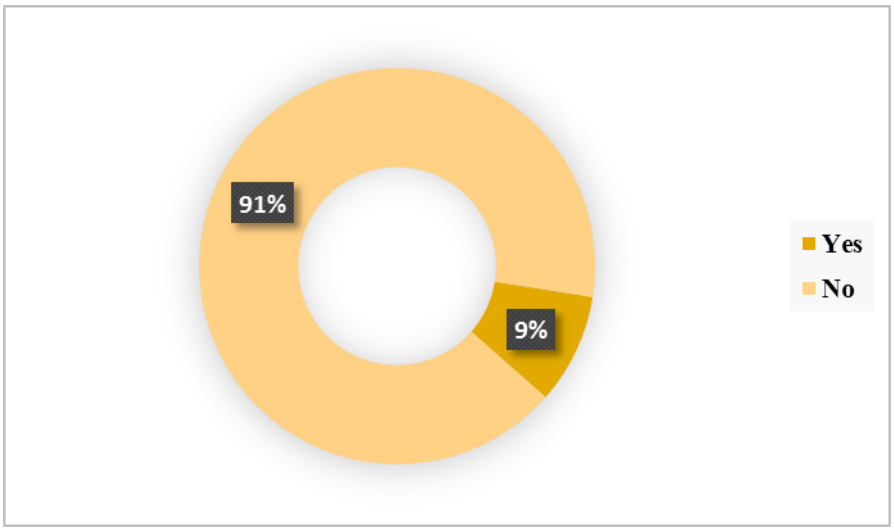

Figure 7: Distribution of Family History of Pcod.

After evaluating the family history of the study participants, it was discovered that **9%** of them had PCOD running in their families.

DISCUSSION

Polycystic ovary syndrome (PCOS) is a prevalent endocrine and metabolic disorder affecting 5%–10% of women in the Western world and 3.7%–22.5% in India. It manifests in various symptoms like amenorrhea, oligomenorrhea, hirsutism, subfertility, anovulation, weight gain, acne vulgaris, and androgenic alopecia. Lifestyle modifications, including diet, exercise, and behavioral changes, are recognized as the primary management for PCOS, particularly in obese women. However, the mechanisms and optimal strategies for these modifications remain poorly understood and underreported.[3,4]

Regarding the distribution of age group, it was observed that since PCOD typically manifests in childhood, many young adults struggle with this issue. Here in this study, it was found that the 750 study participants were separated into three age groups, with the 16-20 age group obtaining the bulk of responses. Regarding the distribution of BMI, it was found that the BMI is the most commonly used anthropometric measurement for classifying individuals into groups. In this study, the 88 PCOD patients were divided into four groups based on their BMI, with 14.77% of them underweight, 55.69% normal weight, 14.77% overweight, and 14.77% obese. Regarding the physical activity of the subjects, it was found that moderate exercise like brisk walking, jogging, cycling or swimming are all great activities that can help with PCOD. Here in this study, it was found that out of 88 PCOD patients in study, 53.4% of them were having 30 minutes of physical activity whereas 46.6% were not having 30 minutes of physical activity. Regarding junk food consumption, it was found that out of 88 patients, 13.65% consumed junk food daily, while 57.95% of the patients consumed weekly. It was also found that 26.13% consumed monthly and 2.27% never consumed. In relation to a study done by **Shrestha A** *et al***.** it was found that about 70% of patients said that they like consuming junk food occasionally.[5] In relation to the consumption of red meat, it was revealed that among 88 PCOD patients it was found that 54.54%of respondents consumed red meat monthly, 31.83%weekly,2.27% daily and 11.36% do not consume red meat. The ideal amount of sleep per night is 6 to 8 hours. According to **Farideh Zafari Zangeneh** *et al***.** out of 77 samples, 23% slept for 8 hours or more, and 54% slept for more than 8 hours.[6] This is comparable to our study, which found that 39.77% of participants slept for longer than 8 hours. The two factors that predict daytime fatigue in women with polycystic ovaries the best are obesity and insulin resistance. 53 women's polycystic ovaries were examined by **A.N. Vgontazas** *et al***.** for their research75% of those who complained about EDS.[7] In our study, just 25% of 88 patients reported feeling exhausted throughout their daily activities. In our

study, it was found that 22.72% of the PCOD patients had a history of PCOD in their family. The study conducted by **Shrestha A** *et al.* which was carried among 50 women suffering from PCOD in Kanpur showed that 28% of them told that there was someone in their family and/or relatives who suffered from PCOD prior to them, while nearly half of the participants didn't know about their family history regarding PCOD.[5]

CONCLUSION

PCOS has been linked to a number of illnesses, including endometrial cancer, depression, obstructive sleep apnea, obesity, metabolic syndrome, poor glucose tolerance, type 2 diabetes, cardiovascular risk, and non-alcoholic steatohepatitis/fatty liver disease. First-degree relatives, prepubertal obesity, congenital virilizing diseases, low or above-average birth weight, premature adrenarche, and valproic acid usage are associated with higher prevalence rates. PCOS symptoms are made worse by obesity, but metabolic, endocrine, reproductive, cardiovascular, and psychological components are improved by weight loss. Short-term obesity treatment in PCOS patients is achieved with lifestyle changes, medication, and bariatric surgery; however, further study is needed to determine long-term consequences and advantages beyond weight reduction.[8,9] Many endocrine and metabolic disorders are commonly believed to be significantly influenced by lifestyle changes. Recent studies have focused on examining the effectiveness and frequency of lifestyle modification in managing PCOS treatment. It is widely recognized that lifestyle factors play a crucial role in the development of PCOD, necessitating lifestyle interventions. While the concept of lifestyle modification for PCOD may seem familiar, questions remain regarding the specific types of modifications that are effective, variances in modifications for different populations, and the underlying mechanisms of these changes. This review aims to comprehensively explore the impact of lifestyle modifications on the progression of PCOD.[6] In our study we found that most of the study population were not having a healthy lifestyle. By focusing on maintaining a healthy BMI, balanced diet, regular physical activity, stress management techniques, and considering family history, individuals can potentially reduce the risk and severity of PCOD. This comprehensive analysis underscores the importance of a holistic approach to managing PCOD through lifestyle modifications and personalized interventions.

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